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09 JAN 2002

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(REV. 5-93)U.S. DEPARTMENT OF COMMERCE  
PATENT AND TRADEMARK OFFICEATTORNEY'S DOCKET NUMBER  
12308/1**TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371**

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

**10/031322**INTERNATIONAL APPLICATION NO.  
**PCT/CH00/00373**INTERNATIONAL FILING DATE  
**06 July 2000**  
(06.07.00)PRIORITY DATE CLAIMED:  
**09 July 1999**  
(09.07.99)

TITLE OF INVENTION

**DRIVE BEARING ARRANGEMENT OF ROTATING TOOLS IN PRINTING MACHINES**

APPLICANT(S) FOR DO/EO/US

**Dieter ARABIN**

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information.

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) immediately rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a. is transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☒ has been transmitted by the International Bureau.
  - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
  - b. ☐ have been transmitted by the International Bureau.
  - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
  - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)) (unsigned).
10. ☒ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
14. ☒ A substitute specification and Marked-Up Copy
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information: International Search Report (translated), Preliminary Examination Report

EXPRESS MAIL NO.: EL243101568US

NO. 1 JAN 2002

APPLICATION NO. if known, see 2.5 <b>10/031322</b>	INTERNATIONAL APPLICATION NO <b>PCT/CH00/00373</b>	ATTORNEY'S DOCKET NUMBER <b>12308/1</b>
17. <input checked="" type="checkbox"/> The following fees are submitted: <b>Basic National Fee (37 CFR 1.492(a)(1)-(5)):</b> Search Report has been prepared by the EUROPEAN PATENT OFFICE or JPO ..... \$890.00  International preliminary examination fee paid to USPTO (37 CFR 1.482) ..... \$710.00  No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) ..... \$740.00  Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$1,040.00  International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) ..... \$100.00		<div style="text-align: right; font-weight: bold; font-size: 1.2em;">           531 Rec'd PCT/PT 09 JAN 2002         </div>
ENTER APPROPRIATE BASIC FEE AMOUNT =		\$ 890
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).		
Claims	Number Filed	Number Extra
Total Claims	3 - 20 =	0
Independent Claims	1 - 3 =	0
Multiple dependent claim(s) (if applicable)		+ \$280.00
TOTAL OF ABOVE CALCULATIONS =		\$ 890
Reduction by 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).		\$
SUBTOTAL =		\$ 890
Processing fee of \$130.00 for furnishing the English translation later the <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).		\$
TOTAL NATIONAL FEE =		\$ 890
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property		\$
TOTAL FEES ENCLOSED =		\$ 890
		Amount to be: refunded \$ charged \$
<div style="display: flex; justify-content: space-between;"> <div style="width: 60%;"> <input type="checkbox"/> A check in the amount of \$ _____ to cover the above fees is enclosed.  <input checked="" type="checkbox"/> Please charge my Deposit Account No. <u>11-0600</u> in the amount of <b>\$890.00</b> to cover the above fees. A duplicate copy of this sheet is enclosed.  <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>11-0600</u>. A duplicate copy of this sheet is enclosed.  <b>NOTE:</b> Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.           </div> <div style="width: 35%; text-align: center;"> <div style="border-top: 1px solid black; width: 100%; margin: 2px auto;"></div>             David I. Greenbaum, Reg. No. 46,739              NAME  <div style="border-top: 1px solid black; width: 100%; margin: 2px auto;"></div>             1/9/02              DATE           </div> </div>		
SEND ALL CORRESPONDENCE TO: Kenyon & Kenyon One Broadway New York, New York 10004  Customer No. 26646		

100131 10/031322  
531 Rec'd PCT/P 09 JAN 2002

[12308/1]

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s) : Dieter ARABIN  
Serial No. : To Be Assigned  
Filed : Herewith  
For : DRIVE BEARING ARRANGEMENT OF ROTATING TOOLS  
IN PRINTING MACHINES  
Art Unit : To Be Assigned  
Examiner : To Be Assigned

Assistant Commissioner  
for Patents  
Washington, D.C. 20231  
Box Patent Application

**PRELIMINARY AMENDMENT AND  
37 C.F.R. § 1.125 SUBSTITUTE SPECIFICATION STATEMENT**

SIR:

Please amend the above-identified application before examination, as set forth below.

**IN THE SPECIFICATION AND ABSTRACT:**

In accordance with 37 C.F.R. § 1.121(b)(3), a Substitute Specification (including the Abstract, but without claims) accompanies this response. It is respectfully requested that the Substitute Specification (including Abstract) be entered to replace the Specification of record.

**IN THE CLAIMS:**

Without prejudice, please cancel original claims 1 to 3 and substitute/annexed claims 1 to 3, and please add new claims 4 to 6 as follows:

4. (New) A drive bearing for printing machines for coupling a rotating tool to a drive shaft of a servomotor, the drive bearing comprising:

an element located at an interface between the tool and the drive shaft on a tool axis,  
the element having an axially projecting coupling cone that engages a counter recess of  
the drive shaft, the cone is releasably held in the recess by frictional engagement,

wherein an angular position of the element is adjustable, and wherein the element is centered and configured to be secured to prevent rotation.

5. (New) The drive bearing according to claim 4 further comprising:  
an undercut on an inner bore of the coupling cone of the element; and  
a tensioning rod having a spreading head, the rod configured to extend through the drive shaft of the servomotor so that the cone frictionally engages the counter recess in the drive shaft in that for a releasable holding of the coupling cone latter is provided with.
6. (New) The drive bearing according to claim 5, wherein the drive shaft further comprises channels for delivering a pressurized medium to detach the cone, released from the tightening rod, from the counter recess in the drive shaft.

#### **Remarks**

This Preliminary Amendment cancels without prejudice original claims 1 to 3 and substitute/annexed claims 1 to 3 in the underlying PCT Application No. PCT/CH00/00373, and adds without prejudice new claims 4 to 6. The new claims conform the claims to U.S. Patent and Trademark Office rules and do not add new matter to the application.


In accordance with 37 C.F.R. § 1.121(b)(3), the Substitute Specification (including the Abstract, but without the claims) contains no new matter. The amendments reflected in the Substitute Specification (including Abstract) are to conform the Specification and Abstract to U.S. Patent and Trademark Office rules or to correct informalities. As required by 37 C.F.R. § 1.121(b)(3)(iii) and § 1.125(b)(2), a Marked Up Version Of The Substitute Specification comparing the Specification of record and the Substitute Specification also accompanies this Preliminary Amendment. Approval and entry of the Substitute Specification (including Abstract) are respectfully requested.

The underlying PCT Application No. PCT/CH00/00373 includes an International Search Report, dated October 13, 2000, and an International Preliminary Examination Report, dated October 16, 2001, copies of which are submitted herewith.

$\frac{d}{dt} \left( \frac{\partial L}{\partial \dot{x}} \right) = \frac{\partial L}{\partial x}$

KENYON & KENYON

KENYON & KENYON

By:   
David I. Greenbaum  
(Reg. No. 46,739)

NY01 438023v1

DRIVE BEARING ARRANGEMENT OF  
ROTATING TOOLS IN PRINTING MACHINES

Background of the Invention

The present invention relates to a drive bearing arrangement of rotating tools in printing machines, particularly label printing machines. Specifically, the arrangement of rotating tools at the drive shafts of such machines, for example, the drive shaft of a servomotor.

It has been found to be advantageous in printing machines---particularly label printing machines---to allocate separate drives by means of a servo motor to the separate units of a printing machine such as the printing cylinder, embossing cylinder, or punching cylinder. This replaces the central drive and gear wheels (or chains or toothed belts).

Such a set-up is beneficial in that the individual components of each printing unit can be exchanged relatively quickly and easily. This allows the machine to be used in a more optimal fashion.

With regard to label printing machines, the highest demands are made on the precise position of each tool. Moreover, the simple and fast exchanging potential poses high demands on the interface of the change functions, namely the drive bearing arrangement between one end of the tools and the drive shaft of the stationary mounted servomotor.

Summary of the Invention

The object of the present invention is to provide a drive bearing arrangement between a rotating tool and a drive shaft which, in consideration of a tool changes,

can be disconnected relatively quickly and improve the precision of the bearing in comparison with conventional solutions.

This object is solved by providing a drive bearing for printing machines for coupling a rotating tool to a drive shaft of a servomotor. The drive bearing includes an element located at an interface between the tool and the drive shaft on a tool axis. The element has an axially projecting coupling cone that engages a counter recess of the drive shaft. The cone is releasably held in the recess by frictional engagement. The angular position of the element is adjustable, and the element is centered and configured to be secured to prevent rotation.

Due to the design of the drive bearing arrangement in accordance with the present invention, a geometrically optimal coupling between the tool and the drive for the rotating printing tools are provided that can be disconnected quickly and easily.

The invention will be explained below with reference to the embodiments illustrated in the drawing somewhat more in detail.

### Brief Description of the Drawings

Fig. 1 schematically illustrates a printing machine with a plurality of printing units and additional parts;

Fig. 2 illustrates a drive bearing of the printing machine shown in Fig. 1 in accordance with the invention; and

Fig. 3 an embodiment of a coupling cone of the

printing machine shown in Fig. 1.

# Detailed Description of the Invention

5           Fig. 1 illustrates a modern printing machine of  
which the parts and printing units are electronically  
controlled through respective servomotors. The printing  
machine includes a web reeling off unit 1, a conditioning  
unit 2, which may include a screen printing device 3, a  
10       printing device 4, a plurality of further printing units  
5 - 9, a flex printing device 10 with a drying device 11,  
a supply part 12, a processing part 13 with punching  
device 14, reeling unit 15 and cutting unit 16, as well  
as a reeling unit 7 as storage part. The individual  
15       units are activated depending on the task at hand.

          The rotating tools can be quickly exchanged in order  
to be available for new tasks.

20           Fig. 2 illustrates how a rotating tool 18 is  
releasably but firmly coupled via an element 19 having an  
axial projecting connecting cone 20 to the drive shaft 21  
of a servomotor 22 (illustrated schematically). The  
other end of the tool 18 is held in a known manner in a  
25       bearing, e.g., a needle bearing located in a detachable  
flange of a frame (not shown). Motor 22 is also mounted  
to a flange 23 of the base frame of the unit.

          The servomotor 22 serves as drive for one of a  
30       variety of cylinders or other devices in the printing  
machine. For example, servomotor 22 can drive a form  
cylinder, a counter pressure cylinder, a coloring  
apparatus, or any additional similar device.

35           The tools (form cylinder, counter pressure cylinder,



coloring apparatus) first extend or pivot away from the frame flanges (not illustrated). Each tool is provided with connecting cone 20 and is inserted into cone shaped recesses 24 of drive shafts 21 and precisely centered therein. In order to have the tool sitting with the correct angular position on drive shaft 21, a pin 25 is employed to anchor the coupling cone 20. The pin 25 also safeguards against unwanted rotation with respect to recess 24. The coupling occurs by frictional engagement between the surfaces of cone 20 and cone shaped recess 24 in that coupling cone 20 is tightened by means of a tightening rod 26 (26') against the drive shaft 21 (for example, by a tightening through a threaded drive).

Tightening rod 26 (26') (see Fig. 2) engages thereto a central undercut bore 27 of the cone 20 where a spreading head is located which can be extended to such an extent that the cone 20 is tightened and an optimal drive connection is provided. In order to release the drive connection or the drive bearing, it is only necessary to release the tightening rod 26 (with spreading head 28).

In order to quickly release the cone coupling, a pressurized medium such as air is passed through channels 29.

Fig. 3 of the drawing illustrates a variant of element 19' with coupling cone 20' and undercut, central bore 27'. This element 19' is suitable for an axial screwing onto a tool by means of several screws (Screw holes 30).

Abstract

A drive bearing for printing machines for coupling a rotating tool to a drive shaft of a servomotor. The drive bearing including an element located at an interface between the tool and the drive shaft on a tool axis. The element has an axially projecting coupling cone that engages a counter recess of the drive shaft. The cone is releasably held in the recess by frictional engagement. The angular position of the element is adjustable, and the element is centered and configured to be secured to prevent rotation.

[DRIVE BEARING ARRANGEMENT OF  
ROTATING TOOLS IN PRINTING MACHINES

5      Background of the Invention] Drive bearing arrangement of  
rotating tools in printing machines

10      The present invention relates to a drive bearing  
arrangement of rotating tools in printing machines,  
[particularly] specifically label printing machines[.  
Specifically, the arrangement of rotating tools at the  
drive shafts of such machines, for example], at the drive  
shaft, e.g., the drive shaft of a servomotor.

15      [It has been found to be advantageous] The present  
development in printing machines[---particularly],  
specifically label printing machines[---to allocate  
separate drives by means of a servo motor to the separate  
units of], goes to no longer to drive the rotating tools  
of the various printing units through a [printing machine  
20      such as the printing cylinder, embossing cylinder, or  
punching cylinder. This replaces the] central drive and  
gear wheels[(or chains or toothed belts).], chains or  
toothed belts, but to rather allocate to each separate  
tool such as e.g. printing cylinder, counter pressure  
25      cylinder, embossing and punching cylinder a own drive by  
means of a servo motor.

30      [Such a set-up is beneficial in that] This leads to a  
printing machine of which the individual components of  
each printing unit can be exchanged [relatively quickly  
and easily. This allows the machine to be used in a more  
optimal fashion.] very fast and in a simple way. Due to  
this a printing machine can be applied optimally.

35      [With regard to] Specifically at label printing machines,

[the] however, highest demands are made on the precise position of each tool[. Moreover, ], which especially due to the simple and fast exchanging [potential] possibilities poses [high] highest demands on the interface of the change functions, namely the drive bearing arrangement between the one end of the tools and the drive shaft of the stationary mounted servomotor.

## [Summary of the Invention]

The object] Object of the present invention [is] has been to provide a drive bearing arrangement between a rotating tool and a drive shaft, which[,] in consideration of a [tool changes,] changing of tools can be disconnected [relatively quickly and improve] very fast and possibly improves the precision of the bearing in comparison with conventional solutions still more.

This object is solved [by providing a drive bearing for printing machines for coupling a rotating tool to a drive shaft of a servomotor. The drive bearing includes an element located at an interface between the tool and the drive shaft on a tool axis. The element has an axially projecting coupling cone that engages a counter recess of the drive shaft. The cone is releasably held in the recess by frictional engagement. The angular position of the element is adjustable, and the element is centered and configured to be secured to prevent rotation.] at a drive bearing arrangement if the kind defined above in accordance with the invention by the features of the characterising portion of claim 1. Specific embodiments of the subject of the invention are defined in the independent claims.

Due to the design of the drive bearing arrangement in accordance with the present invention[,] a geometrically

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to be carried out.

The rotating tools can be [quickly] exchanged fast in order to be available for new [tasks] duties.

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Fig. 2 illustrates how a rotating tool 18 is [releasably but ]releasable but absolutely firmly connected or coupled, respectively, via an element 19 mounted thereto having [an] a axial projecting connecting cone 20 to the drive shaft 21 of a servomotor 22 (illustrated schematically) [. The] (the other end of the tool 18 is held in a as such known manner in a bearing, e.g. [,] a needle bearing which is located in a easily detachable not illustrated flange of a frame [(not shown). Motor 22)]. The motor is also mounted to a flange 23 of the base frame of the unit.

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The servomotor 22 serves e.g. as drive for [one of a variety of cylinders or other devices in the printing machine. For example, servomotor 22 can drive] a form cylinder, a counter pressure cylinder[, a coloring apparatus, or any additional similar device.

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The] or as drive for a colouring apparatus.

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After a extending or pivoting away, respectively, of the (not illustrated) frame flanges the tools (form cylinder, counter pressure cylinder, [coloring apparatus) first extend or pivot away from the frame flanges (not illustrated). Each tool is provided with connecting] colouring apparatus) each of which being provided with coupling cone [20 and] is inserted into the cone shaped recesses 24 of the drive shafts 21 and precisely [centered] centred therein. In order to have the tool sitting with the correct angular position on the drive

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shaft 21[,] a pin 25 is [employed to anchor] foreseen  
which holds the coupling cone 20[. The pin 25 also  
safeguards against unwanted rotation with respect to  
recess 24. The coupling occurs by ] in the correct  
5 position (ads possibly also to safeguard against  
rotating). The coupling proper proceeds by a frictional  
engagement between the surfaces of the cone 20 and the  
cone shaped recess 24 in that the coupling cone 20 is  
tightened by means of a tightening rod 26 (26') against  
10 the drive shaft 21 [(for example,)] by a tightening at the  
right hand side end, e.g., through a threaded drive).

[Tightening] The tightening rod [26 (26')](see Fig. 2)  
engages thereto a central undercut bore 27 of the cone 20  
15 where a spreading head is located which can be extended  
to such an extent that the cone 20 is tightened and a  
optimal drive connection is provided. In order to release  
the drive connection or the drive bearing[,] it is [only]  
merely necessary to release the tightening rod 26 (with  
20 spreading head 28).

[In order to quickly release] For a simple, fast  
releasing of the cone coupling[,] it is possible to use a  
pressurized medium [such as air is passed through] (e.g.,  
25 pressurized air) via channels 29.

Fig. 3 of the drawing illustrates a variant of e element  
19' with coupling cone 20' and undercut, central bore  
27'.

30 This element 19' is suitable for an axial screwing onto a  
tool by means of several screws (Screw holes 30).





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Drive bearing arrangement of rotating tools in printing machines

5 The present invention relates to a drive bearing arrangement of rotating tools in printing machines, specifically label printing machines, at the drive shaft, e.g., the drive shaft of a servomotor.

10 The present development in printing machines, specifically label printing machines, goes to no longer to drive the rotating tools of the various printing units through a central drive and gear wheels, chains or toothed belts, but to rather allocate to each separate tool such as e.g. printing cylinder, counter pressure  
15 cylinder, embossing and punching cylinder a own drive by means of a servo motor.

20 This leads to a printing machine of which the individual components of each printing unit can be exchanged very fast and in a simple way. Due to this a printing machine can be applied optimally.

25 Specifically at label printing machines, however, highest demands are made on the precise position of each tool, which especially due to the simple and fast exchanging possibilities poses highest demands on the interface of the change functions, namely the drive bearing arrangement between the one end of the tools and the drive shaft of the stationary mounted servomotor.

30 Object of the present invention has been to provide a drive bearing arrangement between a rotating tool and a drive shaft, which in consideration of a changing of tools can be disconnected very fast and possibly improves  
35 the precision of the bearing in comparison with

conventional solutions still more.

This object is solved at a drive bearing arrangement if  
the kind defined above in accordance with the invention  
5 by the features of the characterising portion of claim 1.  
Specific embodiments of the subject of the invention are  
defined in the independent claims.

Due to the design of the drive bearing arrangement in  
10 accordance with the present invention a geometrically  
optimal coupling between the tool and the drive for the  
rotating printing tools are provided which can be  
disconnected fast and easily, which allows a fast  
exchanging of tools.

15 The invention will be explained below with reference to  
the embodiments illustrated in the drawing somewhat more  
in detail. There is illustrated in:

20 Fig. 1 purely schematically a printing machine with a  
plurality of printing units and additional  
parts;

Fig. 2 a drive bearing in accordance with the  
25 invention, and

Fig. 3 a variant of the coupling cone.

In the figure Fig. 1 illustrates a modern printing  
30 machine of which the parts and printing units are driven  
electronically controlled through respective own  
servomotors. The printing machine includes a web reeling  
off unit 1, a conditioning unit 2, e.g. a screen printing  
device 3, a printing device 4, a plurality of further

printing units 5 - 9, a flex printing device 10 with a drying device 11, a supply part 12, a processing part 13 with punching device 14, reeling unit 15 and cutting unit 16, as well as a reeling unit 7 as storage part, The individual units get enlisted depending from the order to be carried out.

The rotating tools can be exchanged fast in order to be available for new duties.

Fig. 2 illustrates how a rotating tool 18 is releasable but absolutely firmly connected or coupled, respectively, via an element 19 mounted thereto having a axial projecting connecting cone 20 to the drive shaft 21 of a servomotor 22 (illustrated schematically) (the other end of the tool 18 is held in a as such known manner in a bearing, e.g. a needle bearing which is located in a easily detachable not illustrated flange of a frame). The motor is also mounted to a flange 23 of the base frame of the unit.

The servomotor 22 serves e.g. as drive for a form cylinder, a counter pressure cylinder or as drive for a colouring apparatus.

After a extending or pivoting away, respectively, of the (not illustrated) frame flanges the tools (form cylinder, counter pressure cylinder, colouring apparatus) each of which being provided with coupling cone is inserted into the cone shaped recesses 24 of the drive shafts 21 and precisely centred therein. In order to have the tool sitting with the correct angular position on the drive shaft 21 a pin 25 is foreseen which holds the coupling cone 20 in the correct position (ads possibly also to

safeguard against rotating). The coupling proper proceeds by a frictional engagement between the surfaces of the cone 20 and the cone shaped recess 24 in that the coupling cone 20 is tightened by means of a tightening rod 26 (26') against the drive shaft 21 (by a tightening at the right hand side end, e.g., through a threaded drive).

The tightening rod (see Fig. 2) engages thereto a central undercut bore 27 of the cone 20 where a spreading head is located which can be extended to such an extent that the cone 20 is tightened and a optimal drive connection is provided. In order to release the drive connection or the drive bearing it is merely necessary to release the tightening rod 26 (with spreading head 28).

For a simple, fast releasing of the cone coupling it is possible to use a pressurized medium (e.g., pressurized air) via channels 29.

Fig. 3 of the drawing illustrates a variant of e element 19' with coupling cone 20' and undercut, central bore 27'.

This element 19' is suitable for an axial screwing onto a tool by means of several screws (Screw holes 30).

$$f(x) = \frac{1}{x^2} = x^{-2}, f'(x) = -2x^{-3} = -\frac{2}{x^3}$$

## Patent Claims

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(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES  
PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum  
Internationales Büro



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F16D 1/05, 1/116

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(71) Anmelder (für alle Bestimmungsstaaten mit Ausnahme  
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(81) Bestimmungsstaaten (national): AE, AG, AL, AM, AT,  
AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU,  
CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM,  
HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,  
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TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

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europäisches Patent (AT, BE, CH, CY, DE, DK, ES, FI,  
FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI-Patent  
(BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE,  
SN, TD, TG).

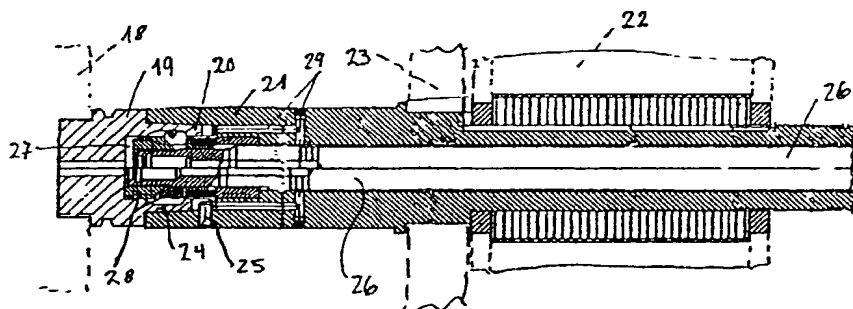
**Veröffentlicht:**

— Mit internationalem Recherchenbericht.

Zur Erklärung der Zweibuchstaben-Codes, und der anderen  
Abkürzungen wird auf die Erklärungen ("Guidance Notes on  
Codes and Abbreviations") am Anfang jeder regulären Ausgabe  
der PCT-Gazette verwiesen.

(54) Title: DRIVE BEARING ARRANGEMENT OF ROTATING TOOLS IN PRINTING MACHINES

(54) Bezeichnung: ANTRIEBSLAGERUNG VON ROTIERENDEN WERKZEUGEN IN DRUCKMASCHINEN



(57) Abstract: The inventive drive bearing arrangement of printing tools (18) on drive shafts (21), e.g. drive shafts of servomotors (22), is based on the use of connecting cones (20) that are mounted on said tools. Said connecting cones provides a drive connection that can be released simply and quickly and is resistant to torsion, and ensure that very high standards of precision (shaft alignment, lateral clearance) are met.

(57) Zusammenfassung: Die Antriebslagerung von Druckwerkzeugen (18) auf Antriebswellen (21), z.B. Antriebswellen von Servomotoren (22), basiert auf der Verwendung von an den Werkzeugen angebrachten Verbindungskonussen (20), welche eine leicht und schnell lösbare, verdrehsichere Antriebsverbindung gewährleisten, welche die Einhaltung höchster Präzision garantieren (Wellenausrichtung, Seitenabstand).

WO 01/03929 A1

Fig. 1

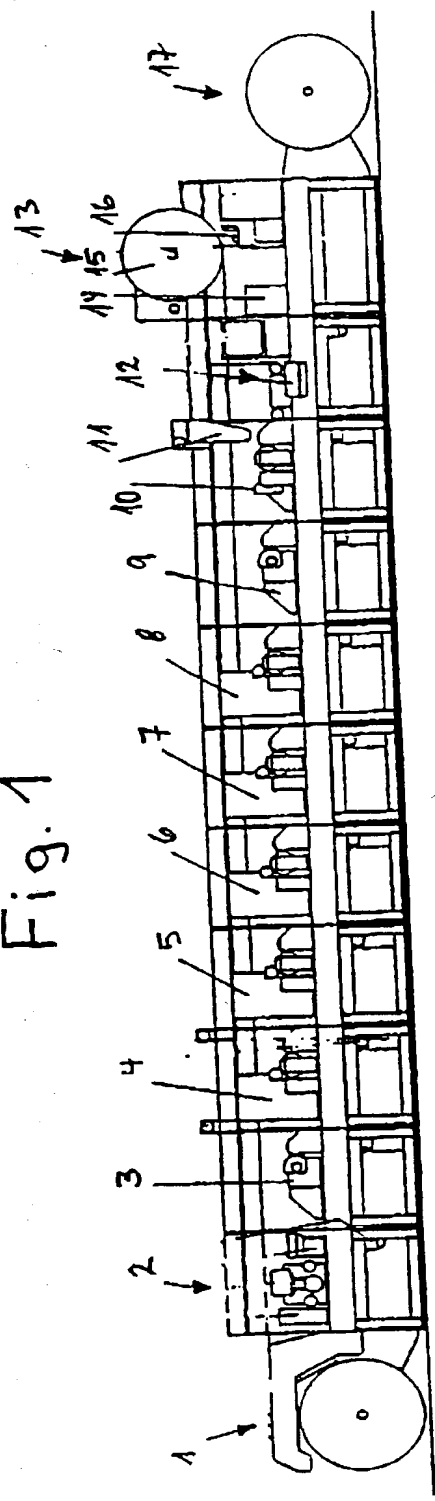


Fig. 2

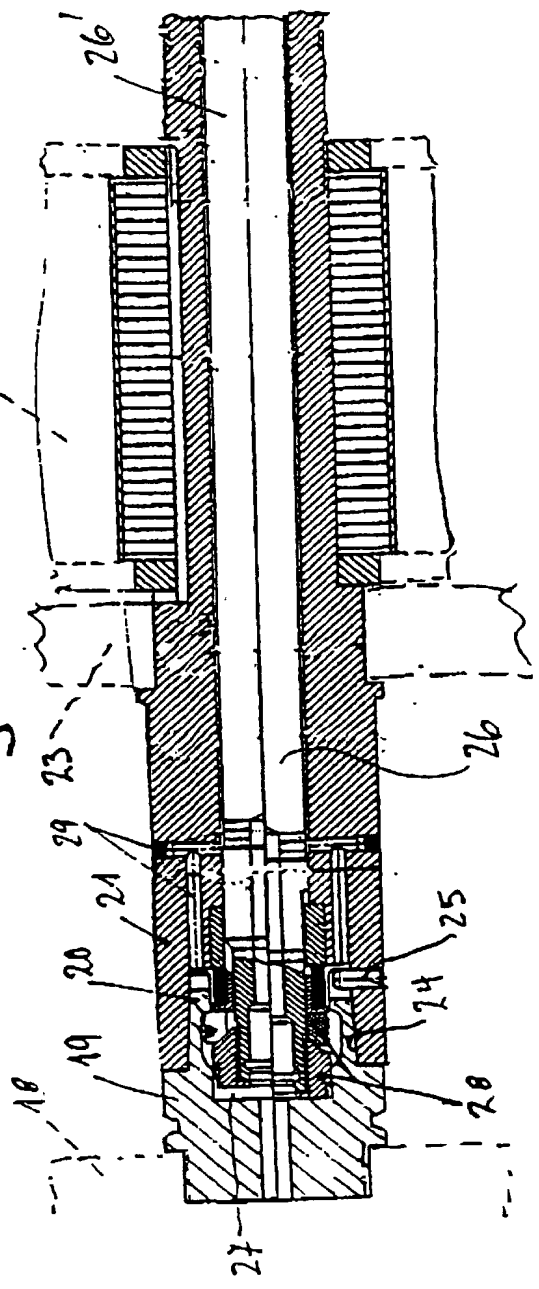
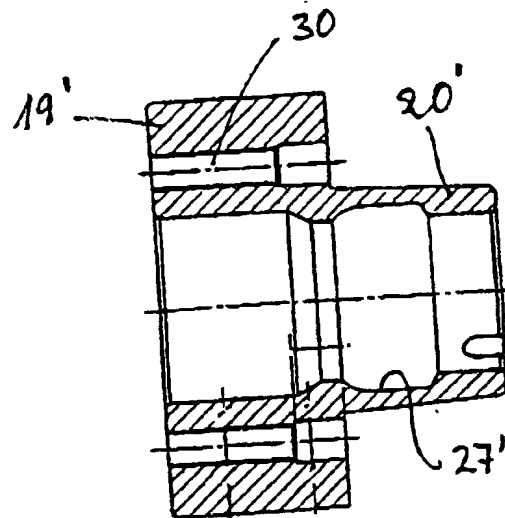


Fig. 3





COMBINED DECLARATION AND  
POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below adjacent to my name.

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled **DRIVE BEARING ARRANGEMENT OF ROTATING TOOLS IN PRINTING MACHINES**, the specification of which was filed as International Application No. PCT/CH00/00373 on the 6<sup>th</sup> day of July, 2000.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a). I hereby claim foreign priority benefits under Title 35, United States Code § 119 of any foreign application(s) for patent or inventor's certificate or of any PCT international applications(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

**PRIOR FOREIGN/PCT APPLICATION(S)  
AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119**

Country : Europe

Application No. : 99 113 288.7

Date of Filing: July 9, 1999

Priority Claimed

Under 35 U.S.C. § 119 : ☒ Yes ☐ No

I hereby claim the benefit under Title 35, United States Code § 120 of any United States Application or PCT International Application designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations § 1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

**PRIOR U.S. APPLICATIONS OR  
PCT INTERNATIONAL APPLICATIONS  
DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. § 120**

U.S. APPLICATIONS

Number :

Filing Date :

PCT APPLICATIONS  
DESIGNATING THE U.S.

PCT Number :

PCT Filing Date :

*[Faint musical notation]*

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